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A

DATA PROCESSING DIGEST

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General Information

The following five digests describe five approaches to planning for electronic data processing. Differences in the approaches appear to be caused by differences in company policy, in the size of the company, and in the nature of its business; as well as by personal preference of the persons directing the planning.

"Feasibility study on the installation of an electronic computer at Hotpoint Co."

W. C. Hill, Hotpoint Co.
AMA Conference, "Electronics at Work," New York, February 1956.

Medium sized computers are planned for a decentralized operation

Hotpoint began its inquiry into the possibility of electronics in late 1954 when the Systems and Procedures people made a broad analysis of the sources of clerical input into the business. This was done to see whether or not a feasibility study was indicated. From this first rough study of about two weeks, it was decided that an electronic system could "reduce clerical costs, provide more comprehensive and timely managament reports, and provide management data that was impractical or uneconomical to obtain under present methods."

A study team was set up consisting of three trained system analysts, and two representatives of the Financial Department, one a machine accounting specialist, the other a cost accountant. These were sent to a one-month programming course. Meanwhile, the specific areas to be studied were selected. They were payroll and labor distribution, distributor sales and inventory sta-

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tistics, billing and sales analysis, cost accounting, general accounting, production and inventory control. On their return from the programming course four of the team worked on analysis of present operations. The fifth studied all available computer systems.

As the study progressed they "concluded that an electronic computer system was not too different from conventional tabulating equipment except that the computer could handle data much faster." The conclusions reached were that a medium-sized computer was justified and that the break-even point would occur when payroll and labor distribution, general accounting, sales statistics, and production and inventory control (about 60% of the proposed work) were installed, using one shift. The remaining applications and a second shift would bring the annual savings to above $100,000. The computer chosen will lease for $5,115 per month, and will allow them to "continue to use punched cards with which we were already familiar throughout the organization." Future plans are for installing similar equipment in each of the decentralized product departments.

Two-week training courses provided by the manufacturer will be given all personnel who will work directly with the computer in the Data Processing Center. Plans are being made to "develop and present an educational orientation course on electronic computers to all personnel who may be affected by or eventually come into contact with the computer systems."

The company feels that the study itself resulted in many areas of system improvement, which "could reduce operating costs by $70,000 per year which represents a savings of more than 2½ times the cost of the study."

"Electronic data processing machines and long range planning"

Ethan S. MacMichael, American Bridge Div., U. S. Steel
AMA Conference "Electronics at Work," New York, February 1956.

Decentralized computing centers improve plant communications

Long range planning, for Ambridge, has three facets: fact-finding and decision-making, communications, and the computer itself. At the present time the Division has two magnetic drum calculators and one CPC. Their first magnetic tape computer is on order. They have found that a smaller computer in each of their plants helps the local personnel understand the data processing problems better than having a central computer. Also, it makes for better communications within the several plants, and it is easier to program and schedule. Another reason for having a decentralized data processing system is that the concept of decentralization has a firm acceptance by management which could not easily be uprooted. "Our view is...that each machine should have capacity for its own environment instead of one machine to do the work of many environments."

They have found that conventional punch card methods "involve visual inspection between successive minor steps" with resulting opportunity for error correction. However, frequent visual error check is not possible with

electronic equipment, which processes large masses of data between inspections. Therefore, operating precision must be obtained through meticulous procedure planning, error-checking programs and virtually error-free source data. Provisions must be made for reporting errors back to those who made them, as a safeguard against incorrect, error-causing procedures.

"Training for electronic computer operation"

F. J. Porter, Jr., Consolidated Edison Co. of New York
AMA Conference "Electronics at Work," New York, February 1956.

Careful training accompanied the computer study program

The paper describes the training program for the Commercial Relations group at Con Edison. The General Accounting group followed a similar pattern, the two being co-ordinated by a top level policy committee.

The training problems were divided into three general phases: 1) training necessary to understand the problem, to make an economic evaluation and to reach a management decision; 2) the selection and training of the staff needed to program the application itself; 3) the training of the employees who must carry out the new clerical procedures and operate the equipment.

In the first phase, a committee composed of several vice presidents, the controller and the general commercial manager and some other executives (which has, during the entire period reviewed the progress and guided the studies) chose the commercial manager and an assistant controller to attend introductory courses at Sperry Rand and IBM. Next a full-time staff of eight persons was given the task of evaluating equipment of the two manufacturers selected. They, too, attended the manufacturer's courses.

This group was then given a minor part of the routine to program, as practical experience, and this was run at the Univac Service Bureau. (The staff spent 1474 man hours programming this part of the routine, debugged it on the computer in 64 man hours, and then actually ran 6700 accounts through the computer in ten minutes.) This staff then turned its efforts toward the economic studies for the management decision to proceed with electronic data processing.

In selecting personnel for the electronic data processing staff, the company "soon came to realize that a major factor was knowledge of our operations sufficiently intimate to permit programming of every detail, however minute. This need caused us to select the bulk of the staff personnel from methods and supervisory people with long service and experience in Commercial Relations operations. However, to prevent the group from being too conservative, we included a number of younger men who were in our management training program. This group has produced an enthusiasm for new and untried methods which stimulate the older men, who in turn through their experience are able to temper the impetuosity of the younger men and keep their enthusiasm within bounds. We believe that this combination of youth and experience gives us a satisfactory programming staff with a minimum of unfavorable characteristics."

Every phase of the commercial operations was represented on the staff in order to acquaint each department with the data processing developments. No special selection techniques were used in selecting the staff. Attributes looked for were intelligence, an open mind, the types of experience desired and the ability to learn. The group was first given all available written material. Then they received a series of five, two-hour sessions on the background of electronic data processing by members of the original committee. Following this, the staff members were sent to the manufacturer's six weeks training course in programming. Later the group was divided into three: systems design, programming, and clerical and control.

Management and top supervision of the Commercial Relations Department were then acquainted with the system by a series of six two-hour conferences. First and second line supervision was given a general indoctrination program of a two-hour lecture.

The company is now in the process of training the employees who are operating the new system. Eight console operators are being sent in pairs to the manufacturer. Operators of the other equipment have a combination of training on the job and a brief period in the manufacturer's service bureau. The company is developing its own training program in procedures and policies for the clerical staff.

(See also: DPD, March, 1956, page 1.)

"Medium scale computer"

R. T. Bruce, J. P. Stevens & Co., New York
AMA Conference, "Electronics at Work," New York, February 1956.

Unbiased "problem analysis" leads to more efficient systems design

In making their feasibility study, the company made their "problem analysis" without reference to their existing procedures, and in a manner which would "best utilize the facilities of the electronic equipment which will be used to process the problem."

The approach used was this:

"It is a fairly simple planning job to block out a complete company activity or divisional activity and conduct a fact-finding survey of each unit or function. By determining the decisions made within each block you can readily establish the activity, not only within the block itself, but the interlocking action between blocks. This philosophy or approach also permits you to ignore the present methods or procedures and should produce objective data that has not been impregnated with tradition and personal opinions."

With this liberal philosophy, they found many areas which needed redefining. For example: "Major responsibilities, while being quite well-defined, were split between major areas of function....because of these

split responsibilities, it was necessary to maintain duplicate sets of records, sometime triplicate sets of records."

In determining the economics of using a computer, both tangible and intangible savings were considered. Intangible savings, while difficult to state in specific amounts, were arrived at by judgment of those benefiting, and were listed as improved reporting, improved timing of reports, and new and different approach to methods and procedures which would provoke new areas of speculation. Education of personnel is the third aspect of an electronics program, and one of the most difficult, which the company is just entering. Their choice is the medium size Univac File Computer, but meanwhile they are using a Univac 120 as a training tool.

With the emphasis on "quality" as a function of "feasibility" the author stresses these three points:

1. "Do not limit your plans or evaluations to a single unit application. Plan in terms of your over-all business, whether it be a single unit operation or a multiple unit operation.
2. "After the over-all scope is established then plan in terms of the single unit application such as Payroll, Sales Analysis, Customer Billing, Operations Cost Analysis, etc., that will match in with your company-wide planning.
3. "Do not accept the methods used in your present operations as criteria for an electronic system. The study program should incorporate, in general, a new approach or a clean up, or at least a review of techniques that will produce a more efficient system."

"A computer development program"

D. A. Woellner, Convair, San Diego
Journal of Machine Accounting, February 1956, pages 4–7, 18, 19, 22, 23.

Convair is redesigning its manufacturing systems for the computer program

Convair began its computer investigation program in January 1954, and has projected it on a planned and integrated basis beyond 1960. A great deal of the effort so far has been expended in management education, and in careful analysis of the areas in which a computer might be used. Two main systems, are being studied: (1) Manufacturing, including Engineering Release, Planning Release, Material Requirements, Material Procurement, Material Inventory systems; (2) Accounting, including Payroll and Labor Distribution systems. These were recognized as being interrelated, and systems analysis studies have been made of the activities within the broad areas. It was decided to transfer the present punched card system in the Accounting area into the computer system, and to redesign the Manufacturing system with the characteristics of the computer in mind.

The method of approach used by Convair can be summed up as follows:

1. An integrated systems approach to computer applications is the only approach which will realize the full benefits of a computer...each procedure and application must be evaluated against and integrated with the requirements of the whole system.
2. A conservative but forward looking approach is required in planning for the installation of a computer....the program can go no faster than management will accept and understand the advantages and limitations of a computer.
3. Education, both formal and informal must be an integral part of the program.
4. There is no single procedure which, applied to a computer, will pay for the cost of the computer.
5. A company cannot wait for someone else to pioneer...when its own individual systems and procedures are applied to a computer, it has to do its own time-consuming systems engineering.

"Looking around"

Joseph L. Massie
HARVARD BUSINESS REVIEW, March–April 1956; pages 139–154.

Clarification of the term "automation"

Quoting from and referring to a group of 21 books and articles on the philosophical aspects of automation, the author attempts to clarify the term, and points to "two dangers to managerial thinking resulting from the recent attention to automation: (1) The dramatic claims made by popular writers could mislead business executives into adopting new techniques--to their later sorrow. (2) Managers might have a tendency to go to the opposite extreme, as a reaction to the glib talk, and discount the true significance of automation, thinking that all the commotion is merely about a continuation of a long trend toward mechanization containing no new fundamental ideas at all ...The deterioration of the word...should not cause us to underestimate the importance of those concepts."

A complete list of the 21 references is given.

"Commercial computer misconceptions--I and II"

A. C. Baker and J. M. Bennett
THE ACCOUNTANT, February 4, February 11, 1956.

Status of business electronics in England

These two articles in the English journal THE ACCOUNTANT, discuss what is meant by commercial computers, the misconceptions held by English business men on the use of a computer in a business application, and the detail in which a computer system must be designed, programmed, and provided with flexibility for later system changes. It offers a basic discussion of the use of electronics compared with punch card calculation, output requirements, and cost.

"Electronic Data Processing for Business and Industry"

By Richard G. Canning

New book published by John Wiley & Sons
Reviewed by A. J. Clark, RAND Corp., Santa Monica, Calif.

A pattern for engineering an integrated data processing system

Since electronic data processing is such a new field, those people actively involved in such work usually gravitated from some other interest, such as engineering or business administration. As a consequence, they were forced to become educated in the principles of electronic data processing by more or less trial and error methods. A new Wiley book, "Electronic Data Processing for Business and Industry" by Richard G. Canning of Canning, Sisson and Associates, should go a long way toward overcoming this difficulty and others encountered in the practical application of electronic data-processing systems.

The book is advertised as answering for management, in management terms, the questions: "What is electronic data processing?" "What can it do for my company?" "How should I go about investigating it?" The main attributes of the book are that it presents for the first time a consistent, across-the-board, standard pattern and guide for engineering an integrated data-processing system, and that it is written in such an easy-to-read style that it makes an excellent introductory text for not only training people in this field but acquainting people with the possibilities and limitations of electronic data processing.

The book is divided roughly into three parts. The first part introduces the subject and establishes the basic principles of electronic data processing. The use of skeletal case histories in this discussion illustrates the principles and serves as a foundation for more detailed development in the second part of the book. The first part also describes characteristics of the major electronics components and the methods for instructing the machine to perform clerical operations.

The second part of the book applies the data-processing principles to a production-control problem and illustrates in more detail the duties and methods of the systems engineer.

The final part of the book is concerned with the choosing of available equipment to make sure all components in the proposed system will tie together properly, and the development of plans for an "intermediate" program concerning the period of time after the electronics system has been ordered but before it has been established.

In general, the avowed purpose of the book is to outline a systematic program of study and planning leading to the preparation of a proposal to top management. The book also mentions some of the complexities of later phases involving the change-over period; details of these phases usually depend upon the characteristics of the particular application and upon the management environment.

The book is concerned with data processing and de-emphasizes technical machine design and operation. Those people now engaged in this kind of work will find many areas of agreement with methods they have developed and practiced through experience. Those who desire to know what electronic data processing can do or cannot do for their business will find many of their answers in this book. Those who wish to gain an insight into the nature of future management operation and decision-making in business, industry, and government will find this book a useful introduction.

((The chapter headings of this book are: Electronic data processing--a new management tool, Patterns of data processing, Summary of electronic data processing machines, Programming typical clerical operations, The systems study, The electronic system: initial design, The electronic system: detailed design, The role of operations research, Equipment characteristics; Management's program for obtaining a reliable system. Price: $7.00.))

"Automated Data Processing"

New booklet, Moore Business Forms*

Forms design based on "system cycles"

ADP is defined as "the continuous and integrated operation of data processing using automatic machines." The "system cycle" is suggested as the basis for a study of the company's forms. The system cycle includes functions which require information common to all the functions within that cycle. Flow charting and forms design would be carried out for each cycle.

Some suggestions are included for flow charting, and for systems design. Seventeen types of common language machines are described and illustrated. This is followed by a short section on high speed printers, which describes the two types, matrix and spinning drum. Three pages are devoted to the use of computers in ADP. A short glossary concludes the booklet. The intent of the booklet appears to be the design of an efficient paperwork system for an existing organization structure.

* This booklet may be requested from any of the Moore Business Forms, Inc. offices.

Management Decision-making Techniques

"Automatic Management: A forecast and its educational implications"

Russell L. Ackoff, Case Institute of Technology, Cleveland
MANAGEMENT SCIENCE, October 1955; pages 55–60.

Management will require more education under "automatic management"

Historically, first production and then clerical processes have been mechanized. Management's decision-making function will also be mechanized. "As a matter of fact, its mechanization and automation have already begun....Operations Research is the bridge...to...'automatic management.'"

If we use computers to carry out the decision-making procedures developed by operations research, and if the outputs of the computers are used to instruct an automatic factory, we have automatic management. The effect of this on management will be:

1. The "automatic managers" will have to be controlled, so managers will have a higher degree of technical knowledge. Today's managers should expand training accordingly.
2. The experience and judgment of management will still be required to allow for non-quantified (hard-to-measure) factors. Human managers, "relieved of the routine aspects of decision making," will have time for ethical, political and esthetic problems.

Other problems will always arise to require human management. Educationally: 1) managers must be made conscious of the decision-making process, and must be well-trained in scientific method--"the most effective way of making decisions yet developed"; 2) managers must (a) know and expand knowledge of organizational behavior and (b) know the machines and processes they control.

"Linear decision rule for production and employment schedules"

C. C. Holt, F. Modigliani, H. A. Simon, Carnegie Institute of Technology, Pittsburgh
MANAGEMENT SCIENCE, October 1955; pages 1–30.

A management tool

A model is developed relating the costs of production and of hiring and firing workers to production rates and inventory levels. The resulting decision-making rule selects each month the least costly production rate and work force for the predicted demand. The theory was tested with historical data (from the plant) and a minimum cost saving of 8.5% ($51,000 per year) was indicated. ((This paper is quite readable; details of the theory are not included.))

Programming

"Automatic coding for large computers"

JOURNAL OF MACHINE ACCOUNTING, March 1956; pages 11, 12.

Writing automatic codes will lighten programming chores later

Automatic coding is the programming of a computer to "execute some of the steps in the preparation or checking of coded machine routines, which otherwise would have to be done by humans." This can be carried to any degree, depending on the ambition of the programmer and the time available.

Three types of "autocodes" are currently being used:

Translator--routine written for the machine to translate simple input language into machine language.

Compiler--codes which assemble some "canned, prewritten, prechecked sub-routines which are of a repetitive nature in our work ....these may be incorporated into a finished machine code by so designing the program of the translator. While the translation is going on, if the translator is given a library file of such subroutines and a means of locating the reference to this file, by giving the proper symbolic command this inclusion of subroutines is accomplished."

Generator--master routines "which have built-in steps to permit either the actual writing of code lines or the filling in of some variable parts of a code with parameter information fed to the generator." For example, "It may take months to write the automatic code, but its products, complete and different sorting routines, take the computer only minutes to produce."

"The organization of a program library for a digital computer center"

Werner L. Frank, Romo Wooldridge Corp., Los Angeles
COMPUTERS AND AUTOMATION, March 1956, pages 6-8.

Computer library organization

The problem of setting up and maintaining a library of computer routines is discussed. One of the problems in setting up such a library is finding a suitable classification system. The author suggests one possibility for classification which has been tried and found successful. This divides the routines into Supervisory (including assembly or compiling, code checking and diagnostic, special arithmetic, and demonstration routines); and General Subroutines (input, output, differential equations, vector algebra, non-linear equations, statistical, interpolation, etc.). It is pointed out that labelling codes should identify each routine uniquely, and include its class, whether it is for fixed or floating decimal, and its status (e.g. is it a revision?).

Equipment

"New electronic system for office operations"

MANAGEMENT METHODS, March 1956; pages 4–6.

Mailing list maintenance and high-speed printing

Eastman Kodak and Addressograph-Multigraph have combined forces to produce a new system comprised of:

1. A magnetic-tape-operated electronic printer which can print up to 3000 lines per minute.
2. A punched-card-to-magnetic tape converter which feeds 600 cards per minute.
3. A selective magnetic tape recording system which records data contained in punched cards on from two to twelve separate tapes.

The system is designed specifically for large mailing operations which need information divided into such categories as, address changes, subscription renewals, expirations, payments, etc. In the system, a unit punched card is kept for each name on a list. Changes are recorded by punching new information into the existing cards, or reproducing old cards along with the new information. The entire file of cards is then fed through the card-to-tape-converter coupled to the required number of tape recorders. The cards are photo-electrically read, then the information required is selectively recorded on the tapes. For example, one tape would contain all up-coming expirations. The magnetic tapes are then used to address the pieces to be mailed. Four-line addresses are printed at the rate of 45,000 per hour.

"LGP–30 General Purpose Digital Computer"

Stanley Frankel and James Cass, Librascope, Inc.
INSTRUMENTS & AUTOMATION, February 1956, pages 264–270.

Small computer

This is a technical description of the small general purpose computer LGP–30, produced by Librascope, Inc., Glendale, California. (See also DPD: February 1956, page 8.)

"A special brain for business use"

BUSINESS WEEK, March 10, 1956, page 172.

Wide tape

Datamatic Corporation's new Model 1000 computer for business applications has a 3-inch wide magnetic tape for file storage. Information can be read at the rate of 60,000 decimal digits per second.

Applications

"Editing at the speed of light--23 years' work done in 1000 hours"

PUBLISHERS' WEEKLY, March 3, 1956; pages 1274–1276.

Univac is compiling Bible Concordance

Thomas Nelson and Sons, publishers of the Revised Standard Version of the Bible will be able to publish its Concordance 23 years sooner than expected by manual methods, by using the Univac. The Rev. John W. Ellison, while preparing his doctor's thesis at Harvard Divinity School, worked with electronic digital computers at Harvard. This gave him the idea of preparing the Concordance electronically, and he presented his idea to the RSV Committee. Testing of the program has been underway since 1953 at the Univac Computing Center in New York, which will do the entire job. The Concordance will be published in 1957.

Systems Design

"Integration of data-processing requirements and the design of electronic equipment"

Paul Kircher, University of California at Los Angeles
THE CONTROLLER, March 1956, pages 107–110.

"Information engineering" is scientific systems design

Now that the need for integration between data processing requirements and data processing equipment has been recognized, some ways must be found to achieve the integration. One approach is to study the types of activities which the data serves. Another approach is to view it from the requirements of decision-making. Another is to measure the data requirements by functions involved. These studies are leading to a new profession of "information engineering," in which the scientific method is used.

In any method, "good systems design integrates not only within a function but between functions." Companies which have plants in different locations also have the problem of geographical integration.

Scientific analysis and model-building techniques are being developed to help evaluate business operations against the standards set by the policies of top management. However, the technical improvements cannot succeed without parallel concern with how the changes affect people. Training and education must accompany them.

Comment

"Operations Research"

There appears to be an increase in the number of articles being published in the area of Operations Research or the Science of Managerial Decision-making. For this reason, it is felt that a review of the nature of OR and its present status is in order. If nothing else, such a review might aid in distinguishing articles applicable to a particular problem from those that are not.

Operations research involves three phases:

1. *Theoretical operations research* covers the development of "models" or basic patterns (usually expressed mathematically) which "explain" or are analogous to actual situations which occur frequently. The theoretical process involves selecting the important factors, defining the relationships between the factors, and defining criteria under which the system operates. For example, in an inventory problem, we might select these factors:

    a) Given by system: average monthly usage, cost per piece, annual cost of each dollar invested in inventory, cost of processing each order.

    b) Controllable: lot size..

    c) Resulting factors: total inventory investment, total orders processed per year.

A typical relationship would be that the average investment in inventory equals one half the typical lot size times the cost per piece. The criterion in this case would be to minimize total variable costs.

2. *Experimental operations research*--in this phase, theories (relationships) that have been developed are tested in actual plants, or by using computers to simulate actual plant conditions (often using historical data).

3. *Operations engineering*--in this phase, proved theories are applied to specific cases in order to improve the particular situation (and not particularly to test the theory). When we tell the production scheduling people to order parts according to a specific procedure derived from an inventory theory, we are applying the theory. As with any engineering program, it is necessary to take into account all of the specific factors peculiar to that business which may not be covered in the theory; in other words to detect and eliminate "bugs" in the system.

Most of the articles appearing in the past (and even now) report on Phase I and II (theoretical and experimental) work. This is not surprising in a new field. Often when a group sets out to engineer an improved system for a particular company, it finds no theory to cover the particular case; so it develops and tests the theory on-the-spot.

Some of the areas in which there are theoretical OR developments are listed below:

AREA	TECHNIQUE	STATUS	
		Theory developed	Application developed
Allocation of material or money	Linear programming	x	x
Situations where material, machines, or people wait in line to be served	Queuing theory	x	x
Distribution of effort in searching (e.g. for customers)	Search theory	x	x
Allocation under conditions of conflict (competition)	Game theory	partly	
Design of communications channels and techniques	Information theory	x	(only some useful concepts)
Inventory decisions (order quantity, time, etc.)	(no special name)	(still evolving)	(limited)
Sequential decision-making (each decision affects future ones)	Dynamic programming	x	
Scheduling of manpower and plant capacity	Both referred to as Production Scheduling theory		
Scheduling of specific jobs through a shop		(just being tested)	
Retail buying decision-making	(no special name)	(evolving)	(some techniques available)
Market analysis	"	"	(some measuring methods available)

Other "models" have been developed for particular cases, which appear to have paid off as applied, but have not become general techniques yet.

From the management point of view, operations research provides another area in which money can be invested (typical OR studies cost from $5000–$100,000). It is an area in which it is very difficult to predict the pay-off; but many who have tried it have found the pay-off quite large (relative to other possible uses of the money).

References:

Operations Research for Management, McCloskey and Trefethan; The Johns Hopkins Press, Baltimore 18, Md. $7.50.

Case Institute Operations Research Conference *Proceedings* (1951, 1953, 1954, 1955). Especially, 1955: "What is Operations Research Accomplishing in Industry?" Case Institute of Technology, Cleveland 6, Ohio. $5.00.

Training

June 18–29
Ann Arbor, Michigan

Digital Computers and Data Processors, summer course at University of Michigan. Fee, $160. For further information write Professor Donald L. Katz, University of Michigan, 2028 East Engineering Building, Ann Arbor, Michigan.

June–August 1956
Cambridge, Mass.

Special Summer Program at Massachusetts Institute of Technology includes the following: June 25–July 7, Operations Research; July 30–August 11, Control Systems Engineering; August 6–11, Electronic Computers and Business Problems; August 13–18, Analog-Digital Conversion Techniques; August 13–18, Business Management and Electronic Data-Processing. For further information write: Office of the Summer Session, Room 7–103, M.I.T., Cambridge 39, Mass.

July 23–August 11
Detroit, Mich.

Wayne University Computation Laboratory, Summer Program: July 23–28, "Automatic Computers–Their Application and Evaluation." July 30–August 4, "Electronic Data Processing in Business and Government." August 6–11, "Applications of Computers to Engineering, Science, and Industry." For information write to: A. W. Jacobson, Director, Computation Laboratory, Wayne University, Detroit 1, Mich.

September 1956
Dayton, Ohio

Office Automation, evening classes at University of Dayton, tentatively set for September. For further information write: Mr. Arthur L. Holt, University of Dayton, Dayton 9, Ohio.

Meetings, Seminars

April 24–27, 1956
Los Angeles, Calif.

Southern California Business Show (N.A.C.A.), Ambassador Hotel. For further information write: R. E. McRann, General Chairman, So. Calif. Business Show, 731 South Spring Street, Los Angeles 14, California.

April 26–27, 1956
New York City

Annual Management Engineering Conference, S.A.M. and A.S.M.E., Hotel Statler. For further information write Society for Advancement of Management, 74 Fifth Avenue, New York 11, N. Y.

May 10, 11, 1956
Washington, D. C.

Annual Meeting, Operations Research Society of America; Sheraton Park Hotel.

May 14–18, 1956
Washington, D. C.

Second Institute of Electronics in Management, The American University. For further information, write: Lowell H. Hattery, Institute Director, The American University, 1901 F Street, N. W., Washington 6, D. C.

May 20–24, 1956
Philadelphia, Pa.

N.O.M.A. Conference and Annual Office Machinery and Equipment Exposition.

June 27–29, 1956
Houston, Texas

National Convention, N.M.A.A.; Shamrock-Hilton Hotel.

August 27–29, 1956
Los Angeles, Calif.

Annual Meeting, Association for Computing Machinery, U.C.L.A. For further information write: Association for Computing Machinery, Box 3251, Olympic Station, Beverly Hills, Calif.

September 30–
October 3, 1956
New York

National Conference, Controller's Institute, Waldorf-Astoria.

October, 1956
Los Angeles, Calif.

National Meeting, The Institute of Management Science, U.C.L.A. (No dates set.)

November 8, 9, 1956
San Francisco, Calif.

N.M.A.A. Second Annual Electronic Business Systems Conference, sponsored by the eleven Western N.M.A.A. Chapters.

November 15, 16, 1956
San Francisco, Calif.

Meeting of Operations Research Society of America, tentatively scheduled for above dates. For further information, write T. E. Oberbeck, Naval Post Graduate School, Monterey, California.

References

The Accountant
4 Drapers' Gardens
Throgmorton Avenue
London EC2, England

American Management Association
1515 Broadway, Times Square
New York, New York

Automation
Penton Building
Cleveland 13, Ohio

Business Week
330 West 42nd Street
New York 36, New York

Computers and Automation
513 Avenue of the Americas
New York 11, New York

The Controller
1 East 42nd Street
New York 17, New York

Elecom Pulse
Underwood Corp.
One Park Avenue
New York 16, New York

Harvard Business Review
Soldiers Field Station
Boston 63, Massachusetts

Industrial Quality Control
161 W. Wisconsin Avenue
Milwaukee, Wisconsin

Instruments and Automation
845 Ridge Avenue
Pittsburgh, Pennsylvania

Journal of Machine Accounting
6109 North Karlov
Chicago 30, Illinois

Management Methods
22 West Putnam Avenue
Greenwich, Connecticut

Management Science
Case Institute
Cleveland 6, Ohio

The Office
232 Madison Avenue
New York 16, New York

Publishers' Weekly
1309 Noble Street
Philadelphia 23, Pennsylvania

Systems
315 Fourth Avenue
New York 10, New York

Systems and Procedures Quarterly
Box 281, Wall Street Station
New York, New York

John Wiley & Sons, Inc.
440–4th Avenue
New York 16, New York

With this issue Data Processing Digest becomes one year old. Perhaps this is the time to put into words some of the policies that have evolved from our pleasant experience of publishing the first twelve issues. One of our readers recently commented on the diversity of style he found in the abstracts. Lest this disturb others, too, let us explain the reason. Nothing which is included in Data Processing Digest except the critical reviews of new books or films, the section titled "Comment," and special articles written by members of the publishers' staff such as "Business Data Processing--a Review," is altered in content, intent or style from the original referenced article. Material taken verbatim from the original is always enclosed in quotes. Explanatory or editorial comment accompanying any abstract is enclosed in double parentheses. Every possible attempt is made by the publishers to keep Data Processing Digest an objective report of the current literature, with any personal bias clearly indicated in the manner mentioned above. As you may imagine, this is not a simple matter, especially when we feel constrained to include material which is newsworthy and well worth reading, even though it violates our own beliefs and practices.

Some experimentation has been done with layout to find the happy medium between convenience for the reader and economy for the publishers. We would welcome any suggestions our readers might have for improvements. And we would also be interested to know in what ways the Digest is being used.

Resource

Following is a list of 77 periodicals which are reviewed regularly by the publishers of DATA PROCESSING DIGEST for significant information in the data processing and related fields.

The Accountant
Accounting Review
Advanced Management
Aeronautical Engineering Review
A.I.E.E. Review
American Business
American Gas Association Monthly
Automatic Control
Automation
Aviation Age
Banking
Bell Laboratories Record
Best's Insurance News
Business Week
Chain Store Age
Chemical Processing
Chemical Week
Computers and Automation
Consulting Engineer
Control Engineering
The Controller
Cost and Management
Credit and Financial Management
Credit Executive
Credit World
Department Store Economist
Dun's Review
Econometrica
Elecom Pulse
Electrical Engineering
Electronic Design
Electronics
Factory Management and Maintenance
Fortune
Harvard Busines Review
Industrial Quality Control
Instruments and Automation
Iron Age
I.R.E. Proceedings
Journal of Accountancy
Journal of Association for Computing Machinery
Journal of Documentation
Journal of the Franklin Institute
Journal of Industrial Engineering
Journal of Institution of Production Engineers
Journal of Machine Accounting
Journal of Society for Industrial and Applied Mathematics
Journal of Operations Research Society
Life Association News
Management Methods
Management Science
Mechanical Translation
Merchants Trade Journal
N.A.C.A. Bulletin
Nation's Business
The Office
Office Appliances
Office Equipment News
Office Executive
Office Management
Oil and Gas Journal
Operations Research Digest
Paperwork Simplification
Production
Purchasing
Railway Age
Research for Industry (Stanford Research Institute)
SAE Journal
Scientific American
The Spectator
Steel
Stores
Systems and Procedures Quarterly
Systems Magazine
Tooling and Production
Wall Street Journal
Western Electronic News

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